



Ministry  
of the  
Environment

Water Resources  
Report 13

Hon. Harry C. Parrott, D.D.S., *Minister*  
Graham W.S. Scott, *Deputy Minister*



# Water Resources of the South Nation River Basin

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.W77  
no. 13  
1980

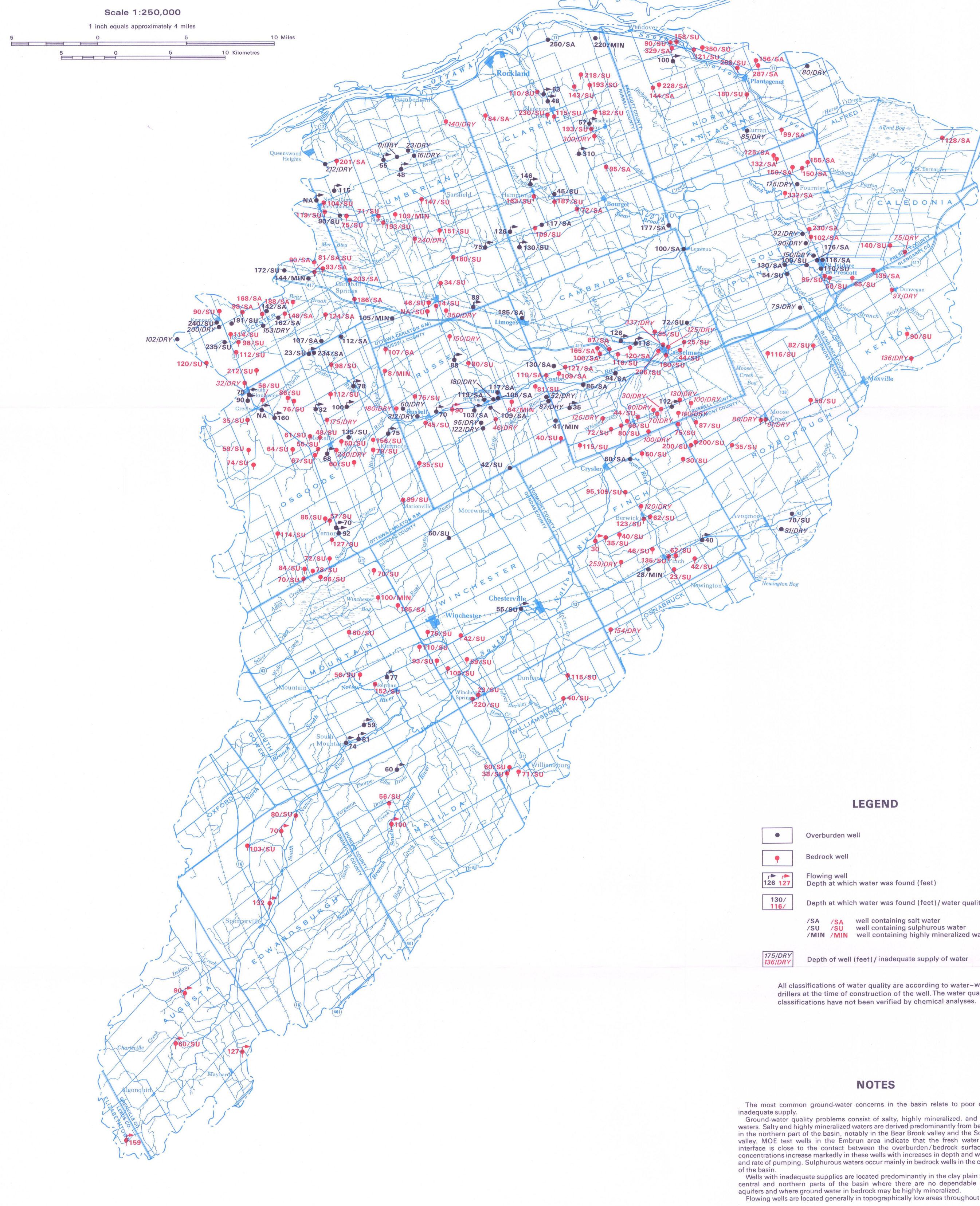


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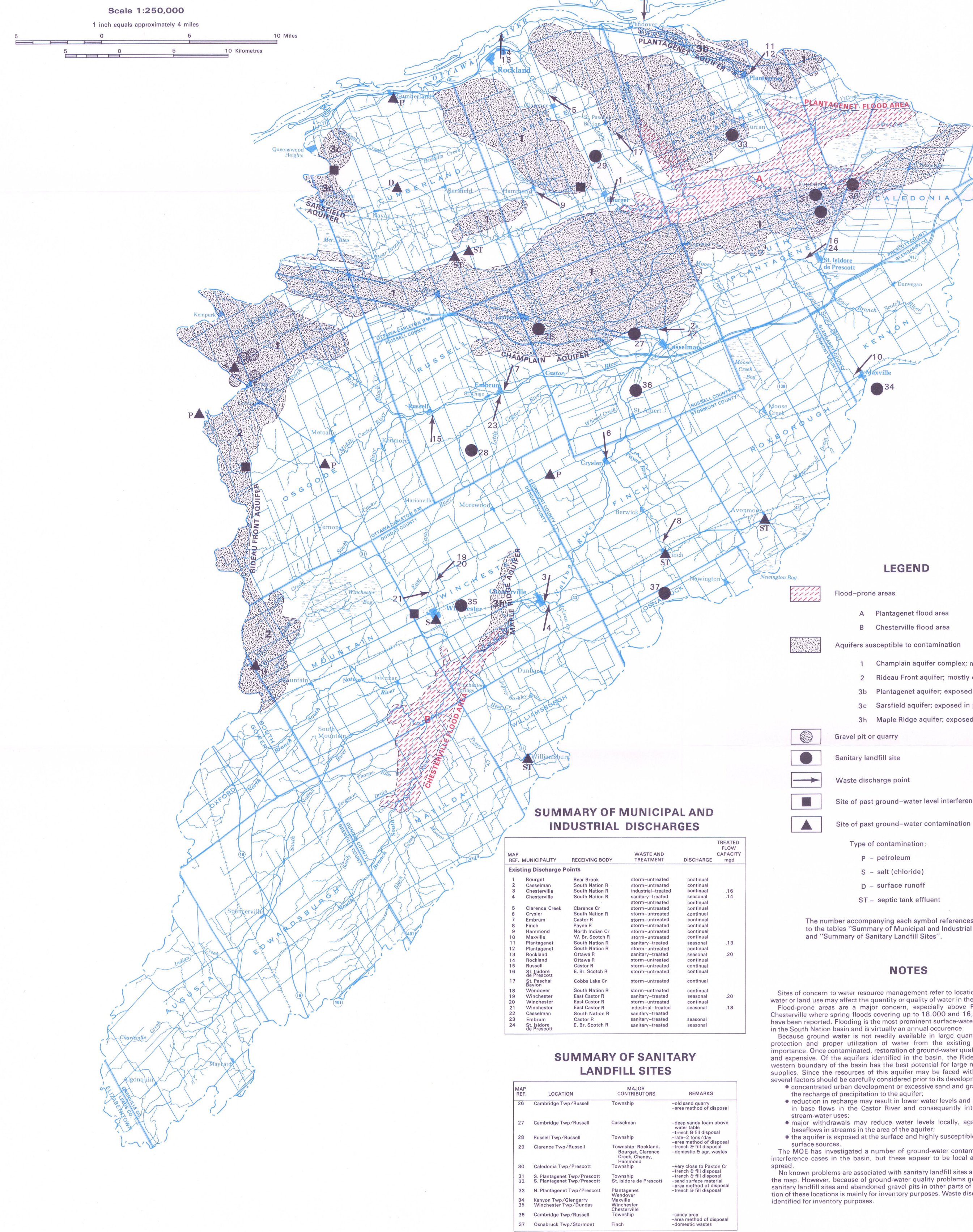


GROUND-WATER CONCERNS



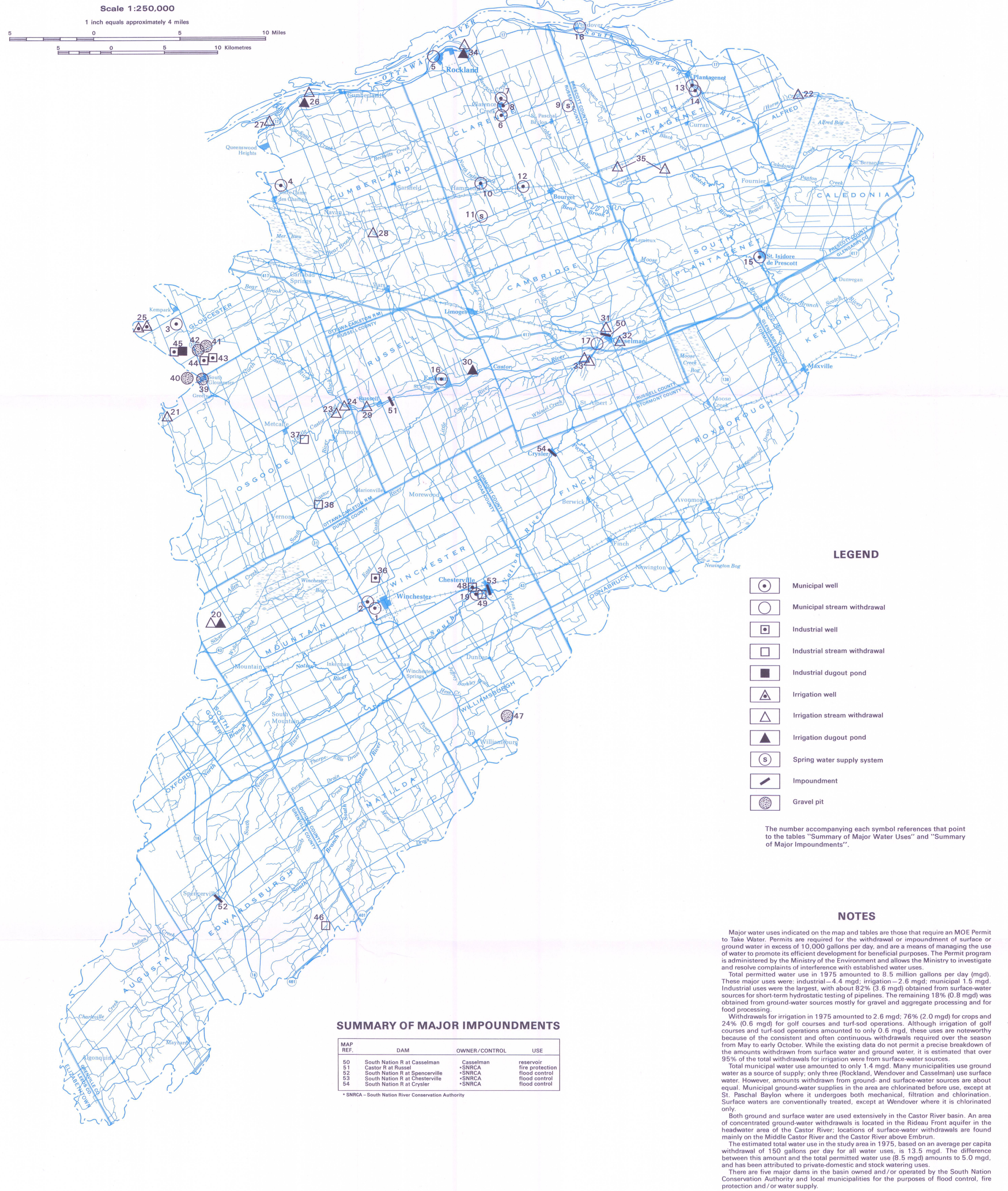
MAP 220

SITES OF CONCERN  
TO WATER RESOURCE MANAGEMENT



MAP 221

LOCATIONS OF MAJOR WATER USES



MAP 222

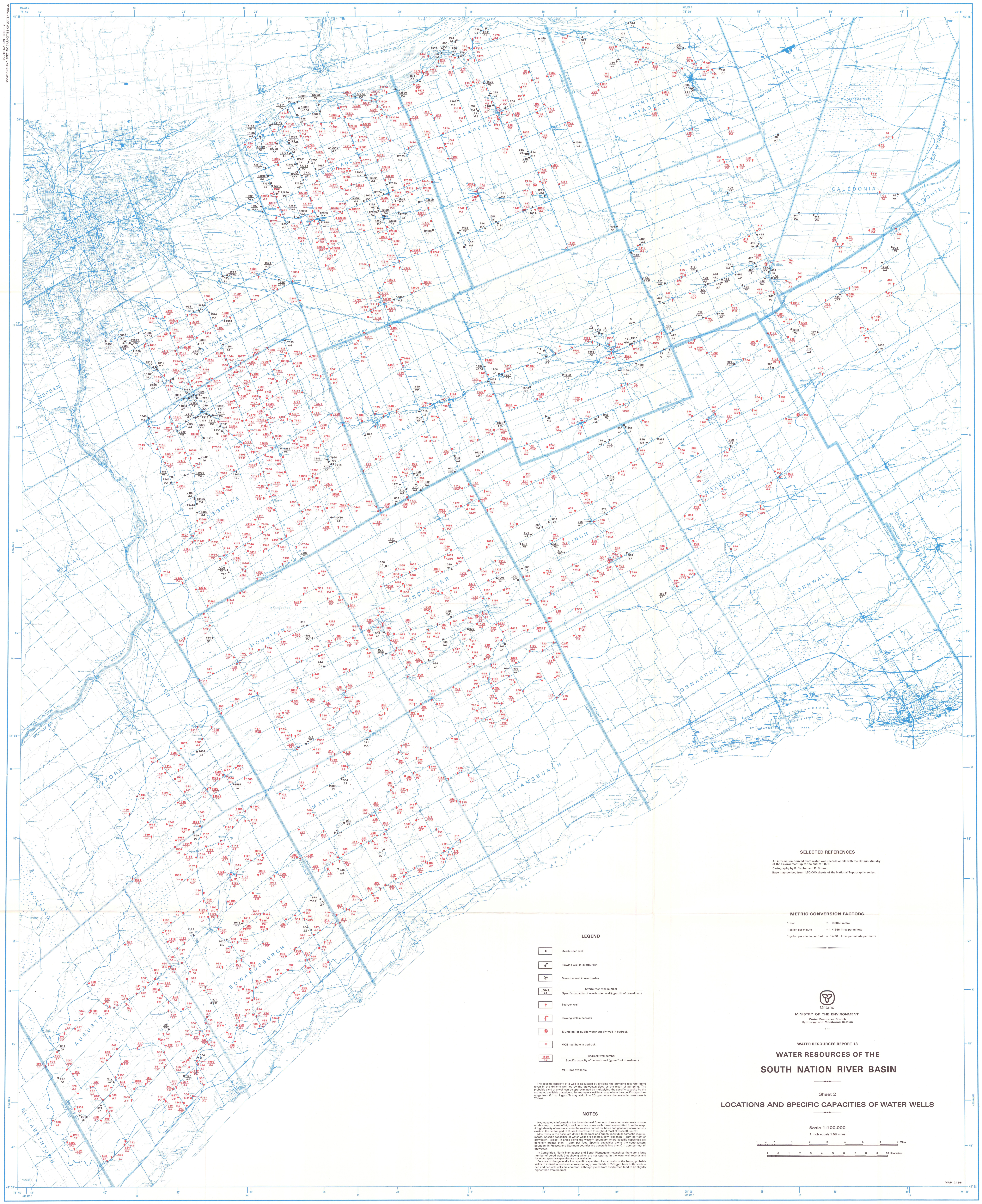
SUMMARY OF MAJOR WATER USES  
(1975)

MUNICIPAL USES									
MAP REF.	SOURCE	WELL NO.	WATER	1975 AUTHORIZED RATE	1975 ACTUAL RATE	1975 REMARKS	MUNICIPALITY	SYSTEM TREATMENT	
1	1001	200	100	100	100	100	100	100	100
2	1002	200	100	100	100	100	100	100	100
3	1003	200	100	100	100	100	100	100	100
4	1004	200	100	100	100	100	100	100	100
5	1005	200	100	100	100	100	100	100	100
6	1006	200	100	100	100	100	100	100	100
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8	1008	200	100	100	100	100	100	100	100
9	1009	200	100	100	100	100	100	100	100
10	1010	200	100	100	100	100	100	100	100
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17	1017	200	100	100	100	100	100	100	100
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19	1019	200	100	100	100	100	100	100	100
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23	1023	200	100	100	100	100	100	100	100
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**SELECTED REFERENCES**

All information derived from water well records on file with the Ontario Ministry of the Environment up to the end of 1976.

Cartography by S. Fischer and D. Berner.

Base map derived from 1:50,000 sheets of the National Topographic series.

**METRIC CONVERSION FACTORS**

1 foot	= 0.3048 metre
1 gallon per minute	= 4.546 litres per minute
1 gallon per minute per foot	= 14.90 litres per minute per metre

- LEGEND**
- Overburden well
  - Flowing well in overburden
  - Municipal well in overburden
  - Overburden well number
  - Specific capacity of overburden well (gpm/ft of drawdown)
  - Bedrock well
  - Flowing well in bedrock
  - Municipal or public water supply well in bedrock
  - MDR test hole in bedrock
  - Bedrock well number
  - Specific capacity of bedrock well (gpm/ft of drawdown)
  - NA - not available

**NOTES**

The specific capacity of a well is calculated by dividing the pumping test rate (gpm) given in the owner's well log by the drawdown (feet) as the result of pumping. The A high density of wells occurs in the western part of the basin and generally a low density exists in the central part of Russell County and throughout most of Precinct County.

Most wells in the basin are drilled to bedrock and supply individual domestic require generally greater than 1 gpm per foot. Specific capacities along the southwestern boundary are generally low. Specific capacities along the southwestern boundary are generally low. Specific capacities along the southwestern boundary are generally low.

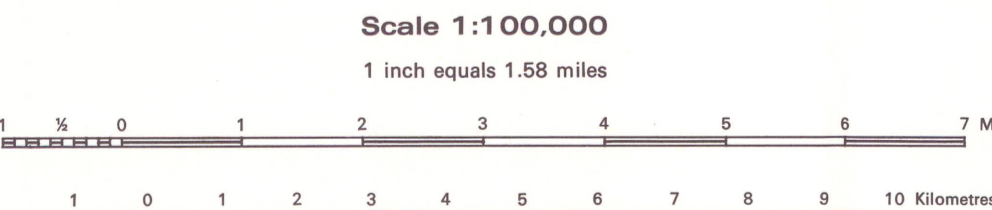
**WATER RESOURCES REPORT 13**

**WATER RESOURCES OF THE**

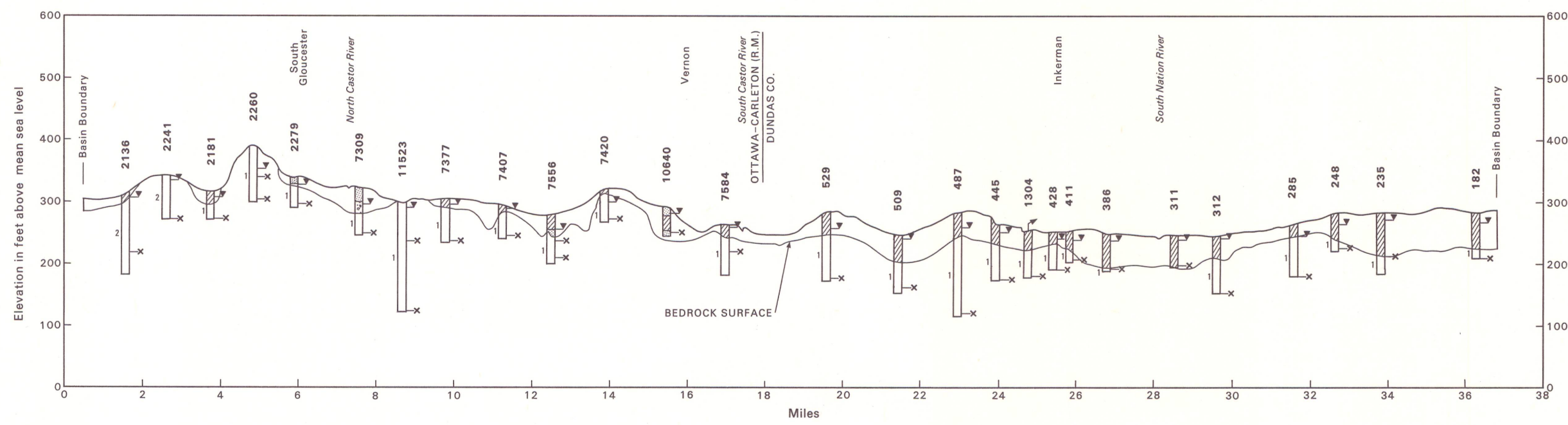
**SOUTH NATION RIVER BASIN**

Sheet 2

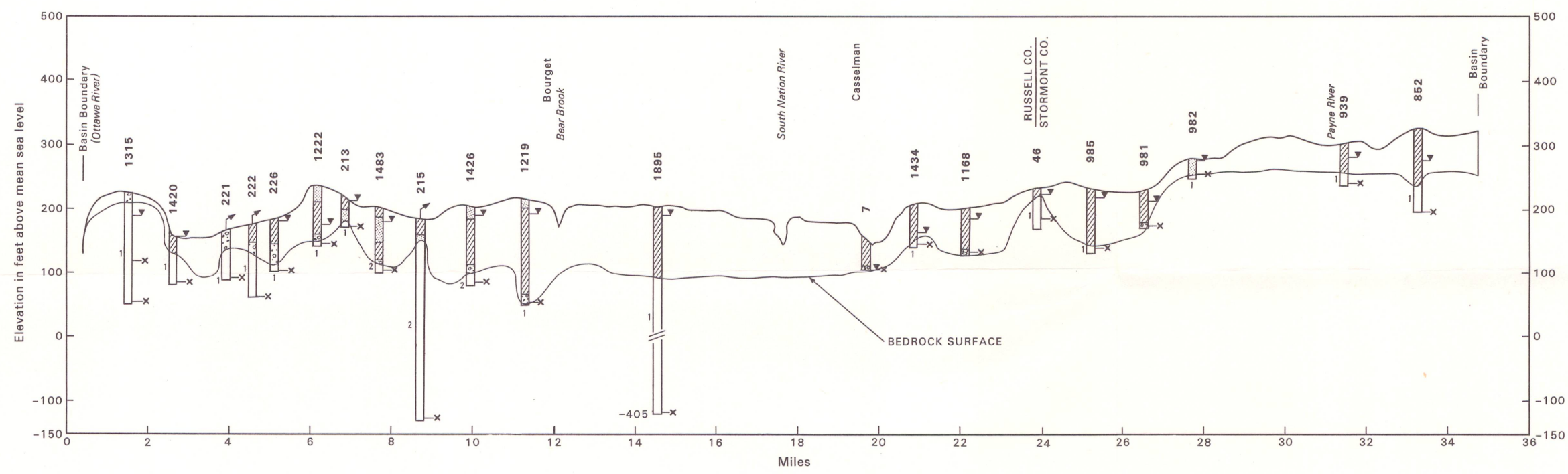
**LOCATIONS AND SPECIFIC CAPACITIES OF WATER WELLS**



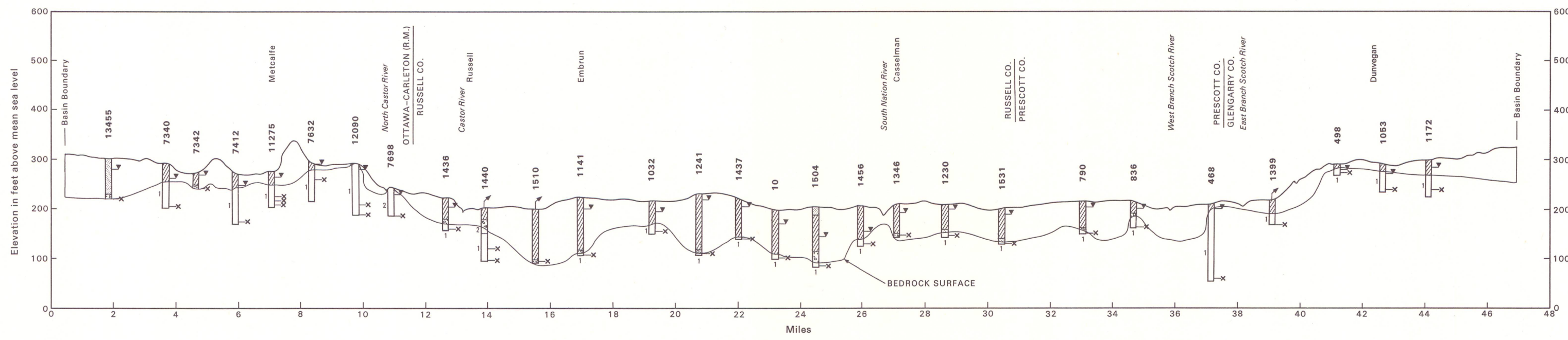




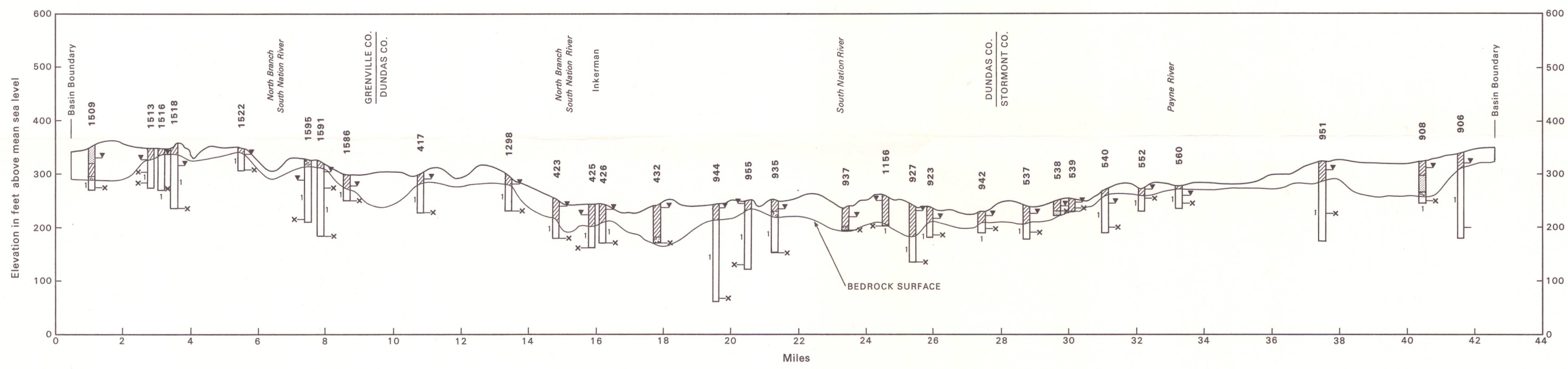
CROSS SECTION A-A'



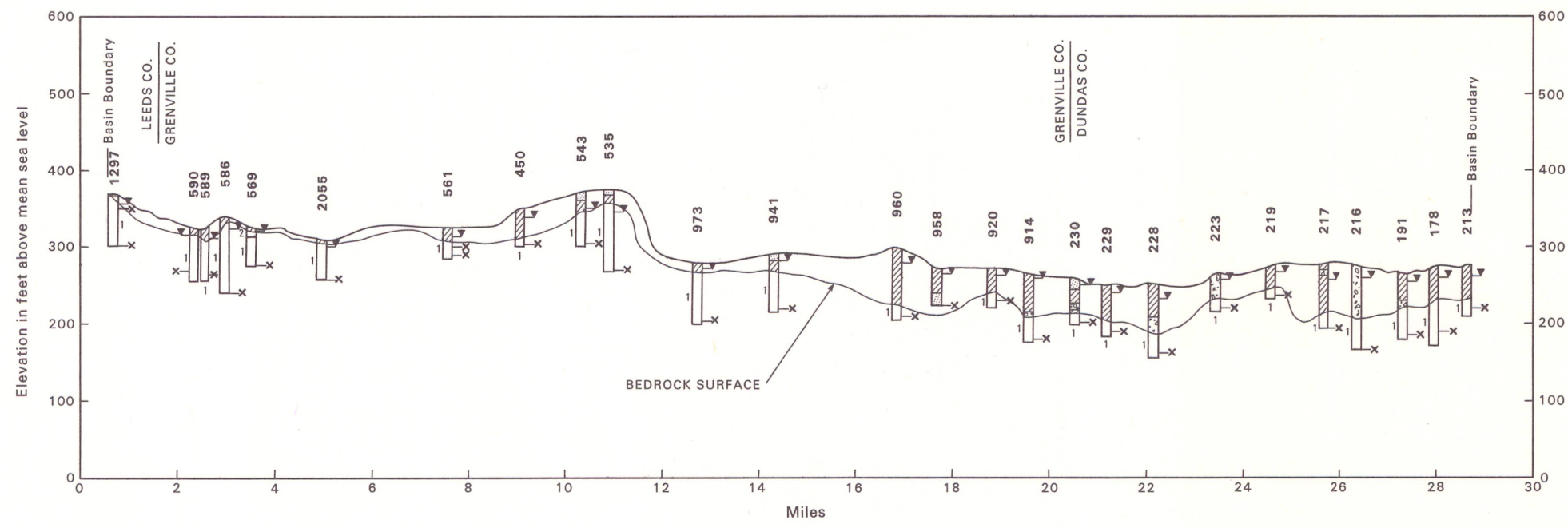
CROSS SECTION B-B'



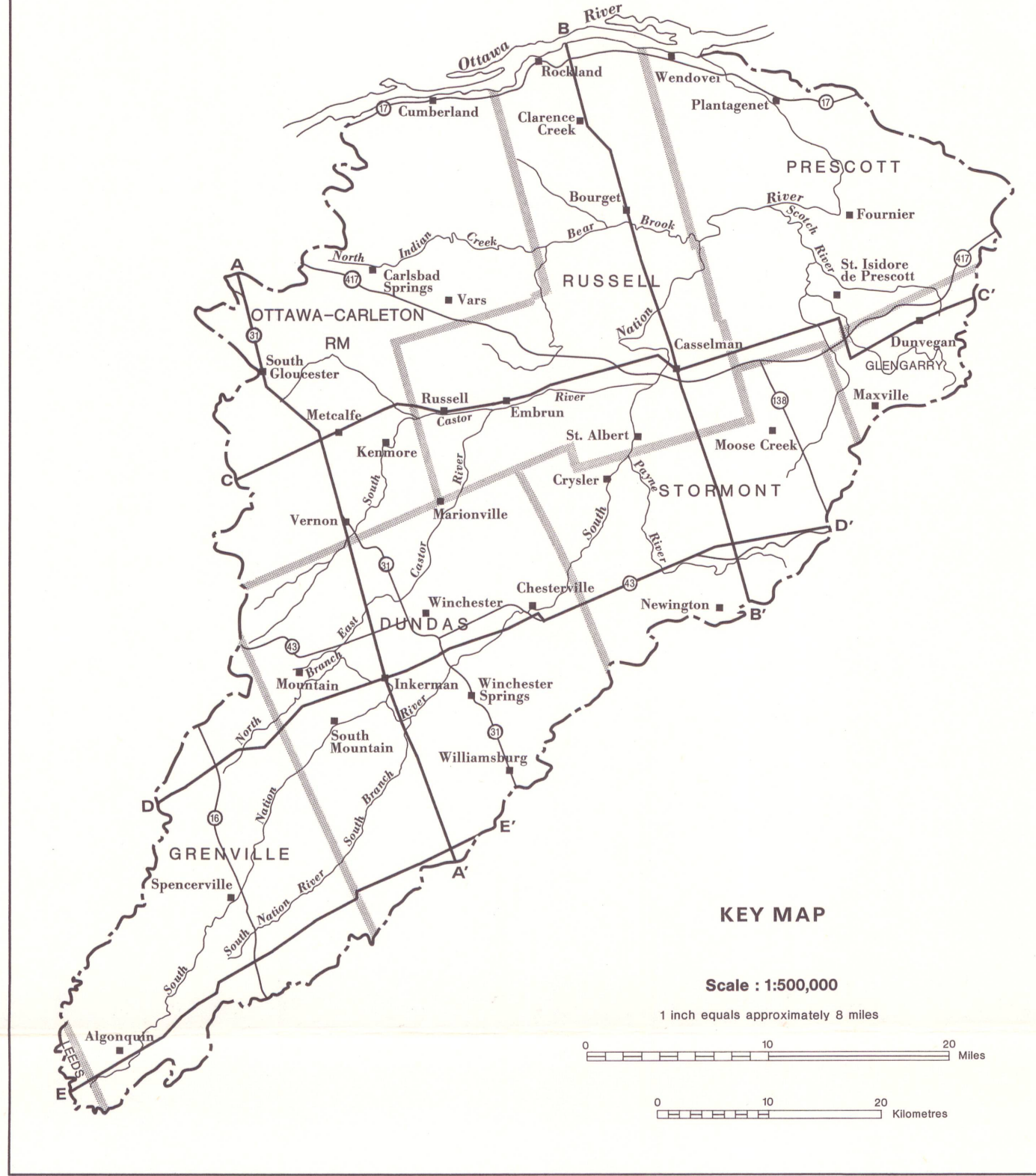
CROSS SECTION C-C'



CROSS SECTION D-D'



CROSS SECTION E-E'



KEY MAP

Scale: 1:500,000  
1 inch equals approximately 8 miles  
0 10 20 Miles  
0 10 20 Kilometres

LEGEND

- Clay, silt, till
- Sand
- Sand and gravel
- 1 Limestone
- 2 Shale
- Static water level
- Flowing well
- Level at which water was found
- 537 Water well record number

All information derived from water well records on file with the Ontario Ministry of the Environment up to the end of 1976.  
Cartography by D. Griffin.

METRIC CONVERSION FACTORS

1 foot = 0.3048 metre  
1 mile = 1.609 kilometres

NOTES

The bedrock immediately beneath the overburden consists mainly of limestone and shale of Ordovician age. Fractures in these rocks yield only moderate amounts of water to wells. The overburden deposits consist primarily of clays, silts and tills, all of which have low permeabilities and generally do not yield significant amounts of water to wells.  
In northern areas, clays of predominantly marine origin are in many places overlain by fine sands that yield small amounts of water to domestic wells (left portion of cross section B-B'). Lenticular and discontinuous layers of sand and gravel (commonly known by drillers as black gravel) are found immediately above the bedrock (cross sections B-B' and C-C'). These deposits are generally thin (less than 10 feet) and yield moderate amounts of water to wells.  
Extensive deposits of highly permeable sands and gravels are found only along the western boundary of the basin (left portion of cross section C-C'). These deposits are generally over 50 feet thick and often yield large amounts of water.  
In the southern parts of the basin, overburden deposits are generally thin (less than 50 feet) and are predominantly clays, silts and tills (right portion of cross section A-A'). Discontinuous layers of sand and gravel are found immediately above bedrock but most wells obtain water from bedrock, which is dolomitic limestone (cross sections D-D' and E-E'), because bedrock wells have generally low maintenance costs.



MINISTRY OF THE ENVIRONMENT  
Water Resources Branch  
Hydrology and Monitoring Section

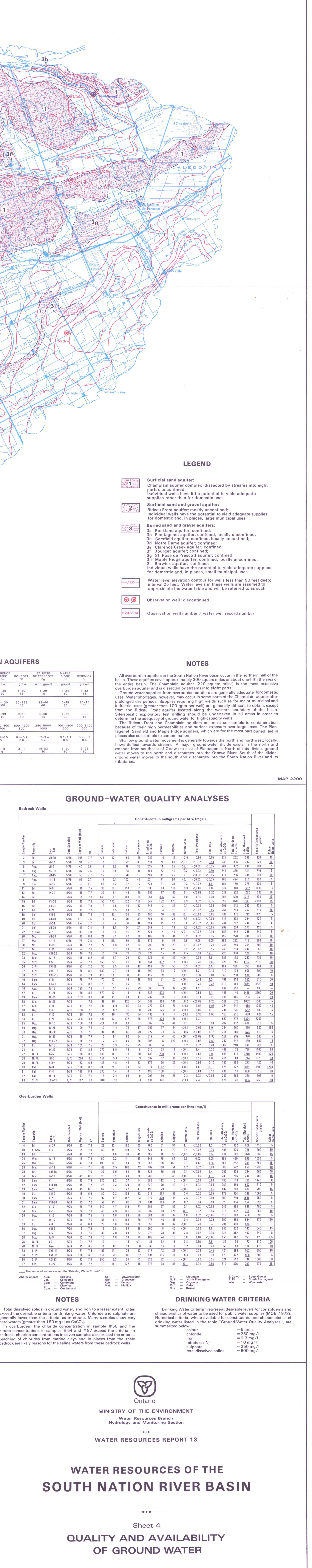
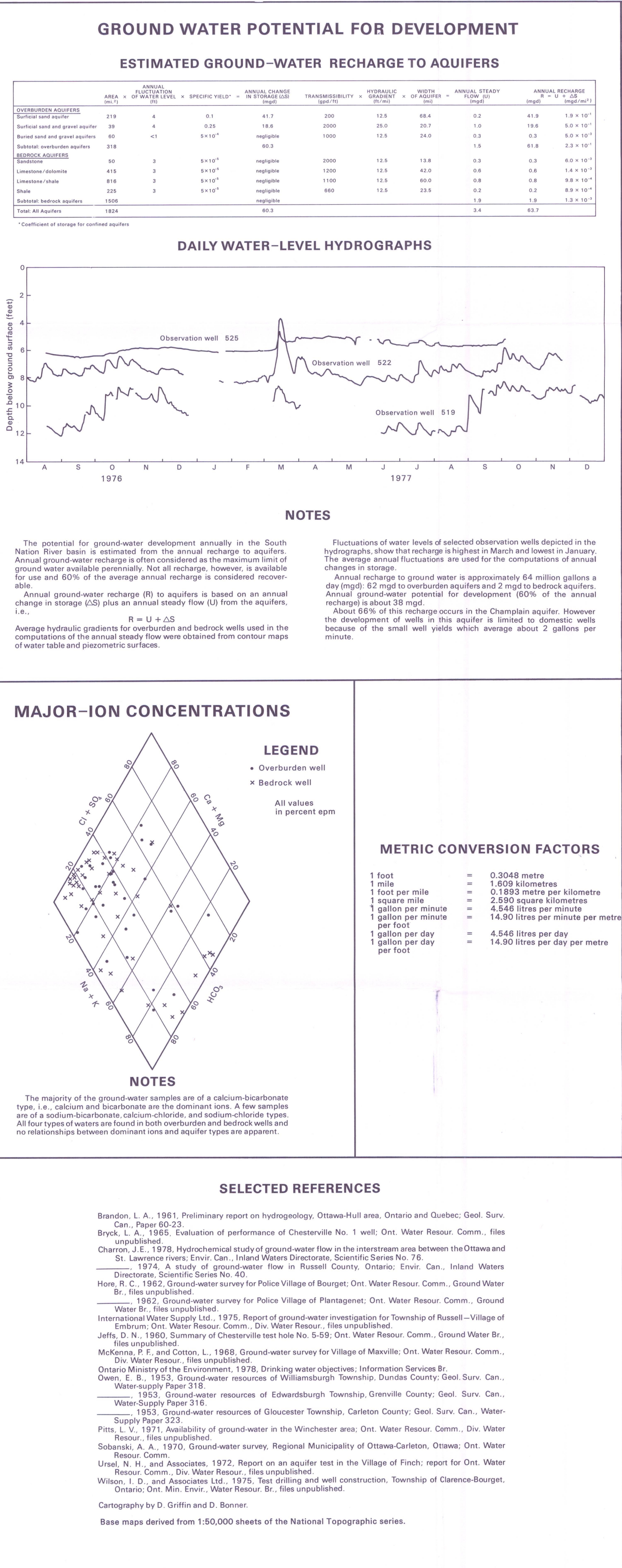
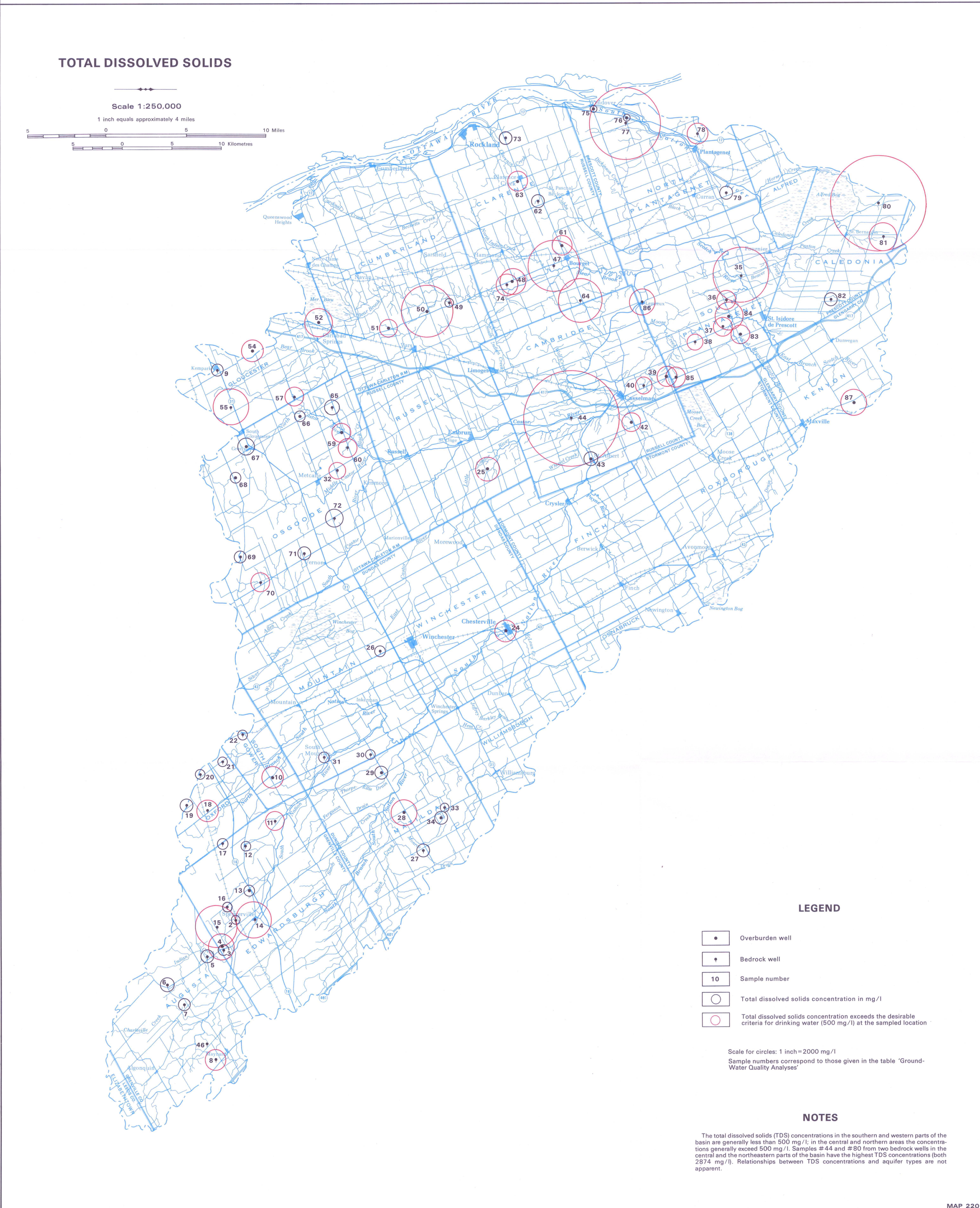
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WATER RESOURCES OF THE  
SOUTH NATION RIVER BASIN

Sheet 3

HYDROGEOLOGICAL CROSS SECTIONS







Canda Department of Natural Resources and Mines. 1975 and 1976. Aerial photographs: 1:25,000, 1:38,000, 1:50,000.

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Ontario Ministry of Natural Resources. 1973. Brief to the Select Committee on Land Drainage; unpublished.

Compilation of tile and improved drainage records from Township files by N. Kittle and H. Macdonald. Ministry of Agriculture and Food, 1977.

Interpretation of aerial photographs by C. Bennett. Ministry of the Environment, 1977. Cartography by D. Griffin and D. Bonner.

Map base derived from 1:50,000 scales of the National Topographic series.



WATER RESOURCES REPORT 13

Sheet 5

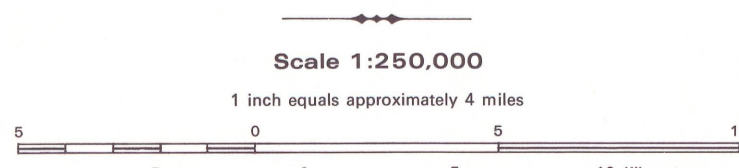
**TILE AND IMPROVED SURFACE DRAINAGE**

Sheet 5

Scale 1:100,000

MAP 2204



LOW FLOWS AS INDICATED BY DAILY  
DISCHARGES EXCEEDED 90% OF THE TIME

## SUMMARY OF STREAMFLOW GAUGING STATIONS

STATION NAME	STATION NUMBER	DRAINAGE AREA (sq. mi.)	PERIOD OF RECORD	TYPE OF RECORD	REMARKS
Bear Brook near Bourget	02L8008	170	1961-1963	MS	Natural flow
Bear Brook at Campbell Springs	02L8011	170	1961-1963	MS	Natural flow
Castor River at Russell	02L8006	285	1961-1963	MS	Natural flow
Peter River near Peterborough	02L8012	58	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8013	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8009	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8010	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8011	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8012	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8013	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8014	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8015	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8016	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8017	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8018	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8019	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8020	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8021	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8022	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8023	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8024	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8025	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8026	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8027	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8028	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8029	930	1961-1963	MS	Natural flow
South Nation River at Casselman	02L8030	930	1961-1963	MS	Natural flow

## NOTES

The above map is based on 25 years (1950-1974) of data on the South Nation River at Spencerville and near Plantagenet Springs. All other streamflow stations in the basin have shorter term records which were correlated with data at the two long-term stations to estimate the 25-year average low flow. This low flow is indicated by daily discharges exceeded 90% of the time.

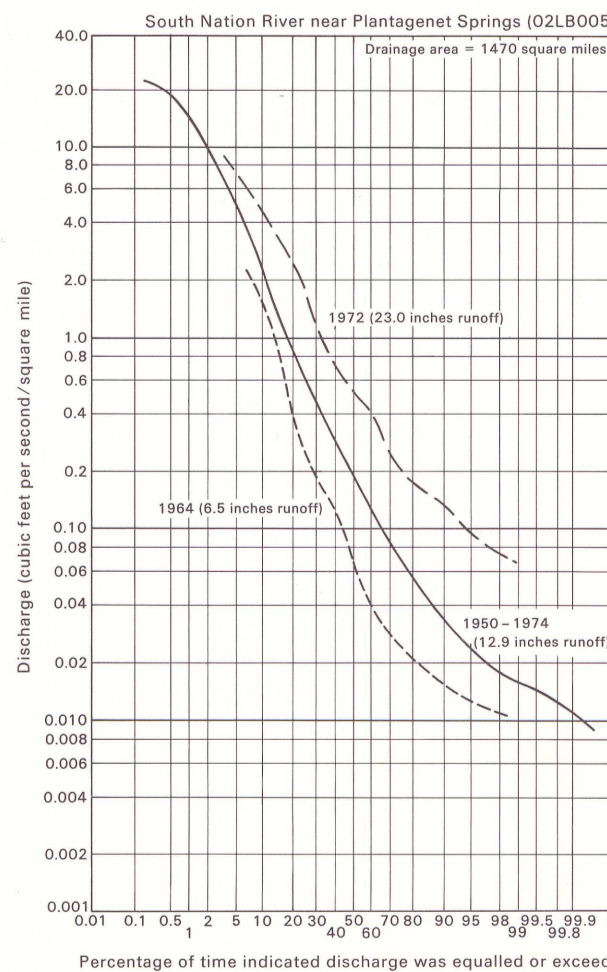
The long-term, average low flow out of the South Nation River basin, as illustrated by the daily discharges exceeded 90% of the time at the streamflow gauging station near Plantagenet Springs (02L8005), is approximately 50 cubic feet per second (cfs), or nearly 27 million gallons per day (mgd). It is important to note that the 50 cfs average represents a mean flow over a 25-year period and the average low flow in any one year may be considerably different. For example, in 1964, a year of below normal discharges, the average daily low flow at Plantagenet Springs was only about 20 cfs, or about 40% of the 25-year average.

Low flow contributions from the southern sub-basins (South Br. South Nation R., North Br. South Nation R., and South Nation R. south of Casselman) are relatively small in comparison to contributions from the northern sub-basins (South Nation R. north of Casselman, Scotch R., Castor R., and Bear Brook). About 10 cfs is contributed by the southern sub-basins and 40 cfs by the northern sub-basins. The contribution of low flows from the southern sub-basins is attributed generally to the absence of large areas of permeable surficial materials that are usually associated with good perennial flows.

In comparison to most southern Ontario basins, the low flow out of the South Nation River basin, on a per square mile basis, is relatively small.

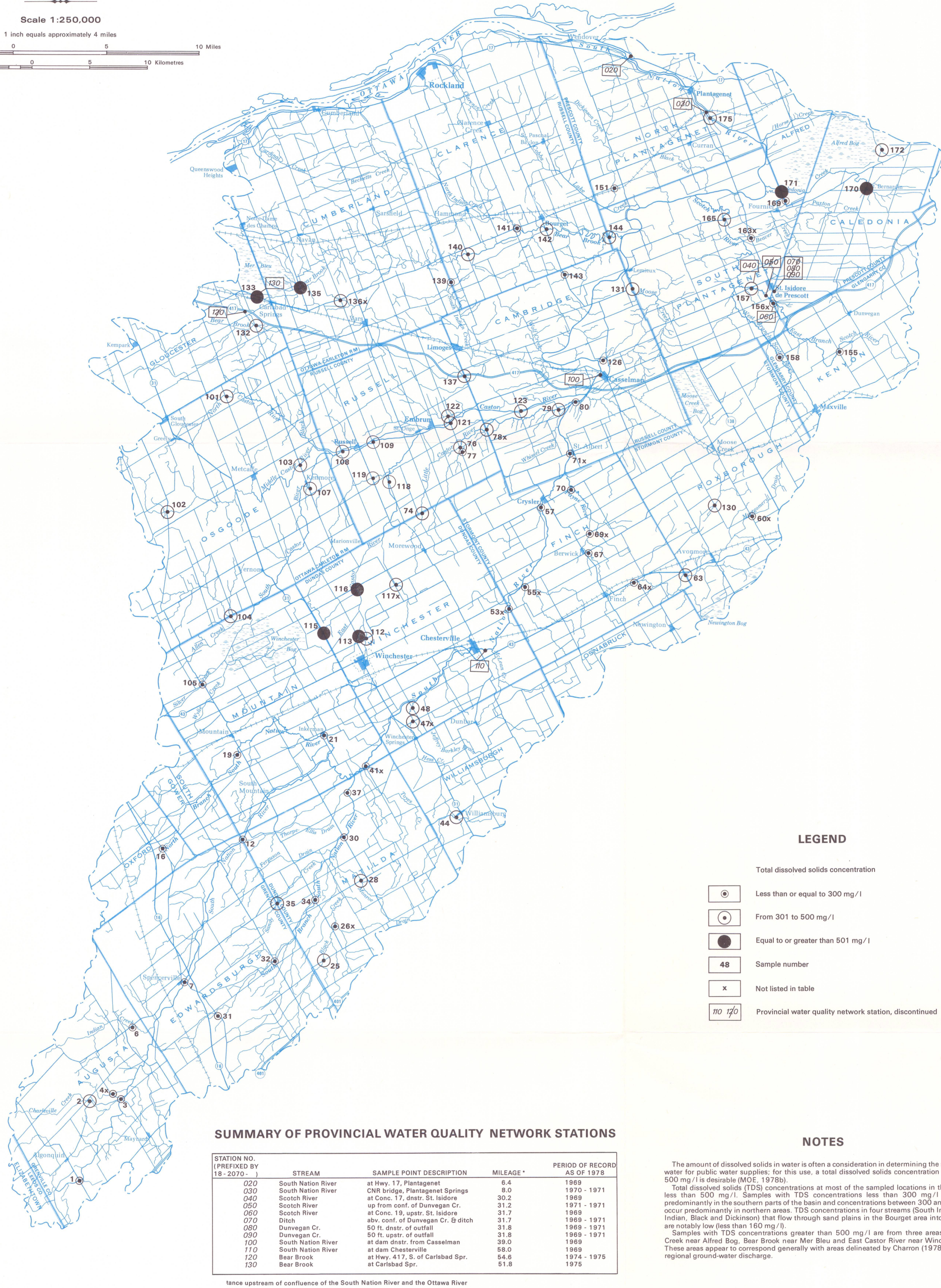
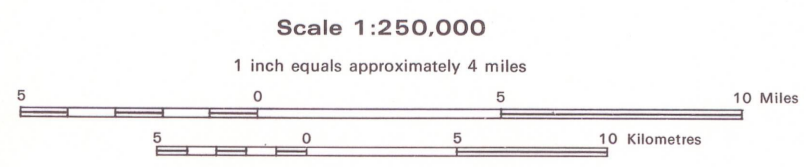
MAP 2205

## DAILY-FLOW DURATION CURVES





TOTAL DISSOLVED SOLIDS



SUMMARY OF PROVINCIAL WATER QUALITY NETWORK STATIONS

STATION NO. (PREFIXED BY 18-2077)	STREAM	SAMPLE POINT DESCRIPTION	MILEAGE*	PERIOD OF RECORD AS OF 1973
020	South Nation River	at Hwy. 17, Plantagenet	8.4	1968
030	South Nation River	at Hwy. 17, Plantagenet	8.4	1970-1971
040	South Nation River	at Hwy. 17, Plantagenet	30.2	1968
050	South Nation River	at Hwy. 17, Plantagenet	30.2	1970-1971
060	South Nation River	at Hwy. 17, Plantagenet	30.2	1968
070	South Nation River	at Hwy. 17, Plantagenet	30.2	1970-1971
080	South Nation River	at Hwy. 17, Plantagenet	30.2	1968
090	South Nation River	at Hwy. 17, Plantagenet	30.2	1970-1971
100	South Nation River	at Hwy. 17, Plantagenet	30.2	1968
110	South Nation River	at Hwy. 17, Plantagenet	30.2	1970-1971
120	South Nation River	at Hwy. 17, Plantagenet	30.2	1968
130	South Nation River	at Hwy. 17, Plantagenet	30.2	1970-1971

LEGEND

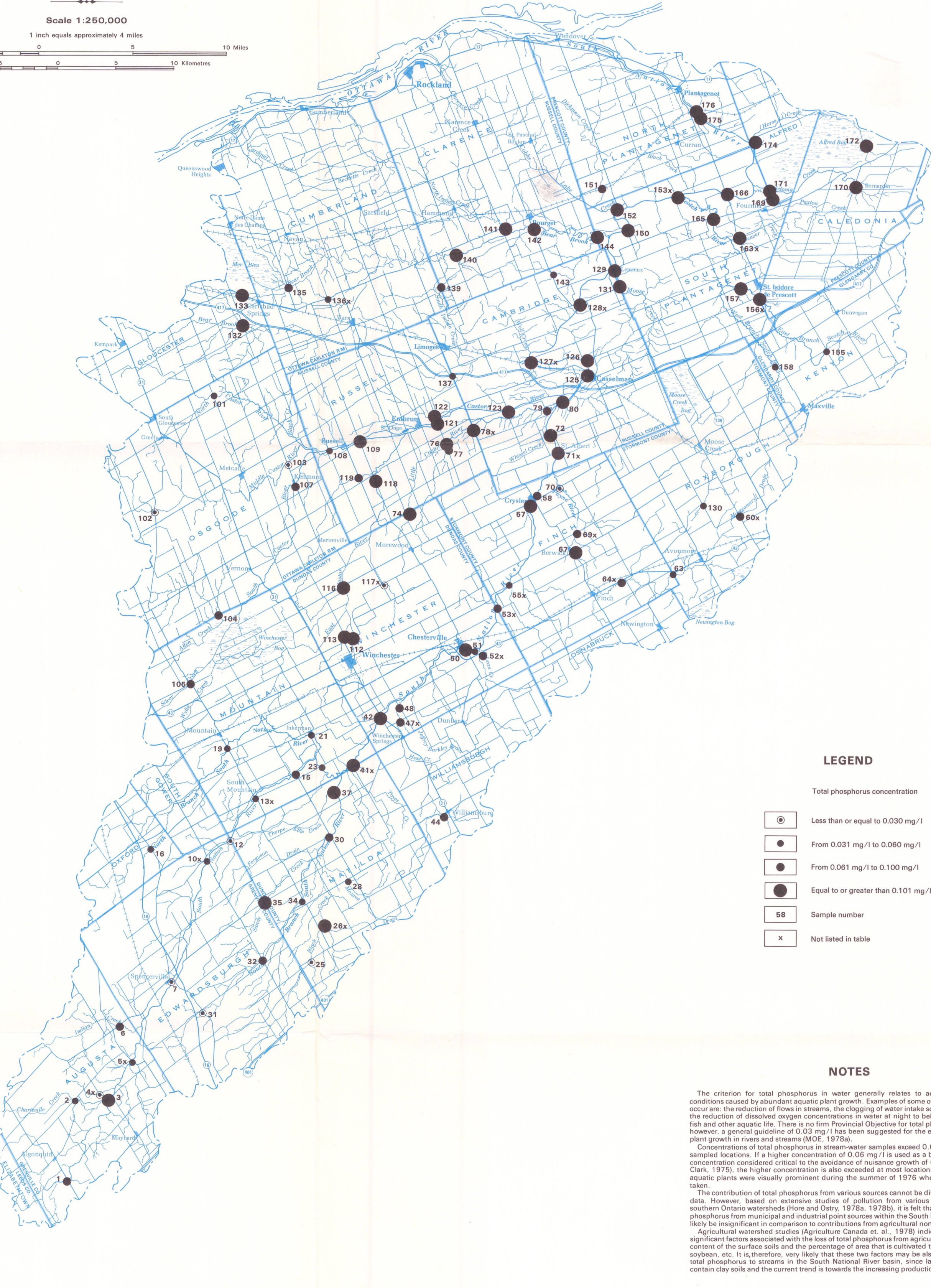
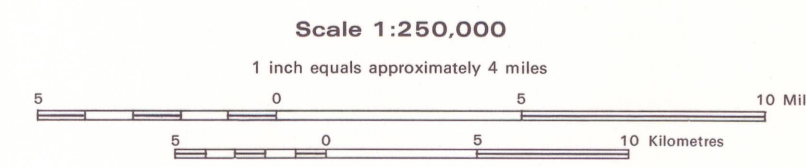
- Less than or equal to 300 mg/l
- From 301 to 500 mg/l
- Equal to or greater than 501 mg/l
- Sample number
- Not listed in table
- Provincial water quality network station, discontinued

NOTES

The amount of dissolved solids in water is often a consideration in determining the suitability of water for public water supplies. For this use, a total dissolved solids concentration of less than 500 mg/l is desirable (MCE, 1978a).  
Total dissolved solids (TDS) concentrations at most of the sampled locations in the basin are less than 500 mg/l. Samples with TDS concentrations less than 300 mg/l are located predominantly in the northern parts of the basin and concentrations between 300 and 500 mg/l occur predominantly in the southern areas. TDS concentrations in four streams (South Indian, North Indian, Black and Chelmsford) that flow through sand plains in the Bouquet area (near Bear Brook) are notably low (less than 150 mg/l).  
Samples with TDS concentrations greater than 500 mg/l are from three areas: Caledonia (at the outlet of the Chelmsford River), Chelmsford (at the outlet of the Chelmsford River), and Chelmsford (at the outlet of the Chelmsford River). These areas appear to correspond generally with areas delineated by Charron (1978) as areas of regional ground-water discharge.

MAP 2206

TOTAL PHOSPHORUS



LEGEND

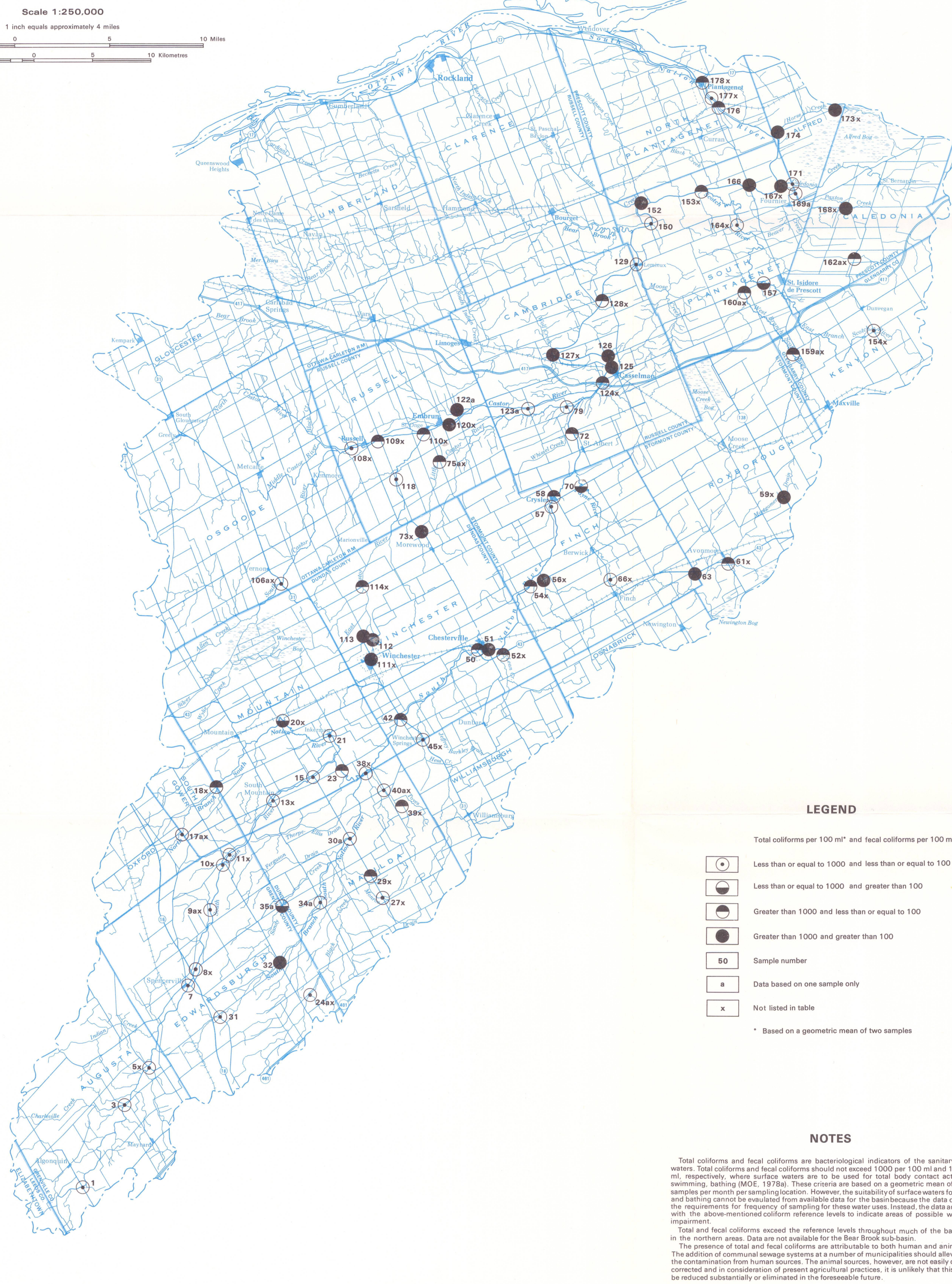
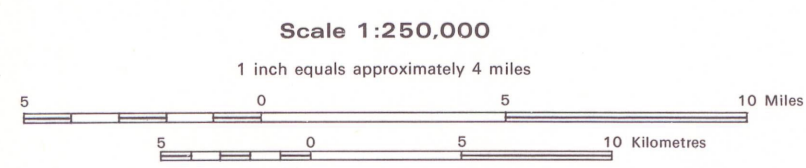
- Less than or equal to 0.030 mg/l
- From 0.031 mg/l to 0.060 mg/l
- From 0.061 mg/l to 0.100 mg/l
- Equal to or greater than 0.101 mg/l
- Sample number
- Not listed in table

NOTES

The criterion for total phosphorus in water generally relates to aesthetic and nuisance conditions caused by abundant aquatic plant growth. Examples of some of the problems that can occur are: the reduction of flow in streams, the clogging of water intake screens and pumps, and the induction of dissolved oxygen concentrations in water at night to below desirable levels for fish and other aquatic life. These problems are more likely to occur in streams with high phosphorus concentrations. A general guideline of 0.03 mg/l has been suggested for the elimination of excessive plant growth in rivers and streams (MCE, 1978a).  
Concentrations of total phosphorus in stream-water samples exceed 0.03 mg/l at most of the sampled locations. If a higher concentration of 0.08 mg/l is used as a basis for comparison, a concentration considered critical to the avoidance of nuisance growth of Cladophora (Wong and Clark, 1978), the higher concentration is also exceeded at most locations. Abundant growth of aquatic plants was visually prominent during the summer of 1978 when water samples were taken.  
The contribution of total phosphorus from various sources cannot be differentiated by existing data. However, based on extensive studies of pollution from various land use activities in southern Ontario watersheds (Wong and Clark, 1978a, 1978b), it is felt that contributions of total phosphorus from municipal and industrial point sources within the South Nation River basin may be negligible in comparison to nonpoint-source phosphorus from agricultural lands in the basin.  
Agricultural watershed studies (Agriculture Canada et al., 1978) indicate that the two most significant factors associated with the loss of phosphorus from agricultural lands are the clay content of the surface soils and the percentage of area that is cultivated to row crops, i.e., corn, soybeans, etc. It is therefore, very likely that these two factors may be also related to the loss of total phosphorus to streams in the South Nation River basin, since large areas of the basin contain clay soils and the current trend is towards the increasing production of corn.

MAP 2207

BACTERIA



LEGEND

- Total coliforms per 100 ml\* and fecal coliforms per 100 ml\*
- Less than or equal to 1000 and less than or equal to 100
- Less than or equal to 1000 and greater than 100
- Greater than 1000 and less than or equal to 100
- Greater than 1000 and greater than 100
- Sample number
- Data based on one sample only
- Not listed in table
- \* Based on a geometric mean of two samples

NOTES

Total coliforms and fecal coliforms are bacteriological indicators of the sanitary quality of waters. Total coliforms and fecal coliforms should not exceed 1000 per 100 ml and 100 per 100 ml, respectively, when surface waters are to be used for total body contact activities (e.g., swimming, bathing) (MCE, 1978a). These criteria are based on a geometric mean of at least 10 samples per month or sampling location. However, the suitability of surface waters for swimming and bathing cannot be evaluated from available data for the basin because the data do not meet the requirements for frequency of sampling for these water uses. Instead, the data are compared with the above-mentioned coliform reference levels to indicate areas of possible water quality impairment.  
Total and fecal coliforms exceed the reference levels throughout much of the basin, notably in the northern areas. Data are not available for the Bear Brook sub-basin.  
The presence of total and fecal coliforms are attributable to both human and animal sources. The addition of communal sewage systems at a number of municipalities should alleviate most of the contamination from human sources. The animal sources, however, are not easily controlled or corrected and in consideration of present agricultural practices, it is unlikely that this source can be reduced substantially or eliminated in the foreseeable future.

MAP 2208

SURFACE-WATER QUALITY ANALYSES

Constituents in milligrams per litre (mg/l)																	
Location Number	Location	Total Coliforms (per 100 ml)	Fecal Coliforms (per 100 ml)	Total Dissolved Solids (mg/l)	Total Phosphorus (mg/l)	Ammonia Nitrogen (mg/l)	Nitrate Nitrogen (mg/l)	Total Nitrogen (mg/l)	Dissolved Oxygen (mg/l)	pH	Total Hardness (mg/l)	Total Solids (mg/l)	Total Suspended Solids (mg/l)	Specific Conductance (micro mhos/cm)	Water Temperature (°C)	Water Depth (m)	Water Velocity (m/s)
1	S. Nation R.	288	12	102	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
2	Chelmsford Cr.	—	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
3	S. Nation R.	310	34	88	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
4	Indian Cr.	—	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
5	S. Nation R.	128	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
12	S. Nation R.	194	61	128	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
18	N. S. Nation R.	—	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
19	N. S. Nation R.	—	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
21	S. S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
23	S. Nation R.	468	44	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
35	Black Cr.	—	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
38	S. S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
39	S. S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
40	S. S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
41	S. S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
42	S. Nation R.	468	44	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
44	Middle Cr.	—	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
48	Horn Cr.	—	—	—	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
50	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
51	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
52	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
53	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
54	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
55	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
56	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
57	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
58	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
59	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
60	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
61	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
62	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
63	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
64	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
65	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
66	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
67	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
68	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
69	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
70	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
71	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
72	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
73	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
74	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
75	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
76	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
77	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
78	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
79	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
80	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
81	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
82	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
83	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
84	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
85	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
86	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
87	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
88	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
89	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
90	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
91	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
92	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
93	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
94	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
95	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
96	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
97	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
98	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
99	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1
100	S. Nation R.	180	40	68	0.002	0.002	1.00	0.04	0.28	210	238	376	73	280	1	1	1



## **WATER RESOURCES REPORT 13**

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